Voith Paper Patent GmbH

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Method for loading a fibrous stock suspension and arrangement to implement said method.

Claims

1. Method for loading a fibrous stock suspension which contains cellulose fibers with calcium carbonate, comprising the following process steps:
   - Adding calcium hydroxide in liquid or dry form, or calcium oxide into the fibrous stock suspension,
   - Adding of gaseous carbon dioxide into the fibrous stock suspension,
   - Precipitation of calcium carbonate through the carbon dioxide and
   - Refining of the fibrous stock suspension during the loading process and washing of the fibrous stock suspension after the crystallizing process and/or the refining process and/or during the refining process and/or after the refining process.

2. Method for loading a fibrous stock suspension which contains cellulose fibers with calcium carbonate, especially according to claim 1, comprising the following process steps:
   - Adding calcium hydroxide in liquid or dry form, or calcium oxide into the fibrous stock suspension,
   - Adding of gaseous carbon dioxide into the fibrous stock suspension, and
   - Precipitation of calcium carbonate through the carbon dioxide,
   - Washing of the fibrous stock suspension prior to feeding the fibrous stock suspension into a headbox chest that is located downstream in flow direction of the fibrous stock suspension and/or into a machine for further processing of the fibrous stock suspension.

3. Method for loading a fibrous stock suspension with calcium carbonate, especially in accordance with claim 1 or 2, comprising the following process steps:
- Feeding into a press arrangement (19, 38, 79) to squeeze out a filtrate from the fibrous stock suspension and
- At least a partial return of the filtrate into an arrangement for pulping the fibrous stock suspension.

4. Method in accordance with claim 3,
characterized in that
the filtrate is returned into a supply-side reservoir, especially a header tank (7).

5. Method in accordance with claim 3 or 4,
characterized in that
the calcium hydroxide is added at least partially in the arrangement for pulping of the fiber stock.

6. Method in accordance with claim 5,
characterized in that
at least in the arrangement for pulping the fibrous stock a pH value of between 7 and 12, especially between 8 and 12 is maintained.

7. Method in accordance with one of the previously cited claims,
characterized in that
aqueous fibrous stock material, especially aqueous paper stock having a consistency of 0.1 to 20%, preferably between 2 and 8% is used as primary raw material.

8. Method in accordance with one of the previously cited claims,
characterized in that
the calcium hydroxide is mixed into the aqueous fiber stock material, especially the paper fiber stock, whereby it has a solids content of between 0.01 and 60%.

9. Method in accordance with one of the previously cited claims
characterized in that
the calcium hydroxide is mixed in through a static mixer (9, 16) or through a header tank.

10. Method in accordance with one of the previously cited claims,
characterized in that
the calcium hydroxide reacts within a range of between 0.01 and 180 seconds, especially between 0.05 and 60 seconds.

11. Method in accordance with one of the previously cited claims,
characterized in that
the dilution water is mixed into the fibrous stock suspension, especially prior to, during or after the addition of carbon dioxide and/or calcium hydroxide or calcium oxide.

12. Method in accordance with one of the previously cited claims,
characterized in that
the carbon dioxide is mixed into a moist fibrous stock suspension.

13. Method in accordance with one of the previously cited claims,
characterized in that

a refining energy in the range between 0.1 and 300 kW per ton dry paper pulp is applied.

14. Method in accordance with claim 13,
characterized in that
the energy supply is controlled by the refining process.

15. Method in accordance with one of the previously cited claims,
characterized in that
a static mixer, a refiner (0), a disperger and/or a fluffer FLPCC reactor are utilized as a reactor, whereby the fibrous stock content, especially the paper content is between 0.01 and 15% in the instance of a static mixer; at between 2 and 40% in the instance of a refiner and a disperger, especially between 2 and 8% for LC refining and between 20 and 35% for HC-refining, and between 15 and 60% in the instance of a fluffer-FLPCC-reactor.

16. Method in accordance with one of the previously cited claims,
characterized in that
an expenditure of energy of between 0.3 and 8 kWh/t, especially between 0.5 and 4 kWh/t is used for the precipitation reaction, especially if no refining process is utilized.

17. Method in accordance with one of the previously cited claims,
characterized in that
the process temperature is preferably between -15 °C and 120 °C, especially between 20 and 90 °C.

18. Method in accordance with one of the previously cited claims,

characterized in that

that rhombohedral, scalenohedron and spherical crystals are formed.

19. Method in accordance with claim 18,

characterized in that

the crystals measure between 0.05 and 5 μm, especially between 0.3 and 2.5 μm.

20. Method in accordance with one of the previously cited claims,

characterized in that

that static and/or moving, especially rotating mixing elements (68) are utilized.

21. Method in accordance with one of the previously cited claims,

characterized in that

it is carried out in a pressure range of between 0 and 15 bar, especially between 0 and 6 bar.

22. Method in accordance with one of the previously cited claims,

characterized in that

it is carried out at an pH value of between 6 and 10, especially between 6.5 and 9.5.

23. Method in accordance with one of the previously cited claims

characterized in that

the reaction time is between 0.01 seconds and 180 seconds, especially between 0.05 and 60 seconds.

24. Apparatus for implementation of a method in accordance with one of the claims 1 through 23,

characterized in that

prior to a dewatering screw (19) an additional static mixer (9) is provided in which the fibrous stock suspension is blended with a filtrate and/or a calcium hydroxide suspension.

25. Apparatus in accordance with claim 24,

characterized in that

fibrous stock suspension filtrate that was yielded in the dewatering screw (19) can be returned through a pipe (2) to a header tank (7) or to another preceding device for fiber stock preparation.

26. Apparatus in accordance with claim 24 or 25,

characterized in that

an additional static mixer (52) in which the fibrous stock suspension is washed is provided preceding a crystallizer (61).

27. Apparatus in accordance with claim 26,

characterized in that

an additional washer (38, 79) for cleansing of the fibrous stock suspension is provided after the crystallizer (25, 61).

28. Apparatus in accordance with claim 26 or 27,

characterized in that

an additional static mixer (52) into which the fibrous stock suspension can be returned is provided preceding the crystallizer (61).